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# The "3-Day Rule" for Stool Tests May Not Apply When Using PCR Panels

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The "3-day rule" is a commonly used policy in microbiology laboratories, as literature suggests that stool tests performed after a patient has been in the hospital for 3 days are unlikely to recover any pathogens (1–3). Nikolic and colleagues (4) recently reported the implementation of a clinical decision support tool which prohibits electronic ordering of stool culture, the *Giardia*/*Cryptosporidium* enzyme immunoassay (EIA), and ovum and parasite examinations for patients who have been in the hospital for more than 3 days. The restriction can be overridden by calling the laboratory. The authors reported that the number of tests that were performed on patients who were in the hospital for greater than 3 days following the implementation fell approximately in half. Throughout the study period (22 months), they found one patient each with *Endolimax nana*, *Cryptosporidium*, *Campylobacter*, *Salmonella*, and *Strongyloides* in the population hospitalized for >3 days.

Gastrointestinal molecular (PCR) panels are becoming more commonly used and have replaced conventional testing methods in many labs. Validation of the 3-day rule in settings where a gastrointestinal (GI) panel is used has not been published. We recently reported our results of a clinical evaluation of the FilmArray GI panel, in which we performed the GI panel on samples with an order for a stool culture (5). Of 241 patients in our study, 41 samples were submitted from patients who had been admitted for >72 h. Six of these samples were found to be positive. The patients' characteristics and the organisms that were identified are shown in Table 1. The percent positivity rates for samples collected before and after 72 h were 36.5% and 14.6%. We did not report *Clostridium difficile* results from the panel.

Although the 3-day rule appears to lead to cost savings when used for conventional methods, such as the EIA, microscopic examinations, and cultures, it may not apply to the use of a GI PCR panel with a far higher probability of detecting potential pathogens.

Certain organisms may lead to symptoms or worsening of symptoms during a hospitalization, such as *Giardia* or *Cryptosporidium*, especially if the patient is undergoing an immunosuppressing therapy (i.e., chemotherapy). A recent study of the FilmArray GI panel on immunocompromised hematologic patients found that of 61 patients who submitted stool samples >72 h after admission, 3 were positive for Norovirus, 2 were positive for *Campylobacter*, and one each was positive for *Giardia*, enteropathogenic *Escherichia coli* (EPEC), and enterotoxigenic *E. coli* (6). In this patient population, long hospital stays are common.

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**TABLE 1** Characteristics of six patients with positive results by the GI panel after >72 h in the hospital[a]

| Age (yr)/sex | Pathogen detected | Symptom(s) | Final diagnosis | No. of hours after admission that specimen was collected | Total length of hospital stay (days; midnight to midnight) | Service(s) | Immunocompromised status | Contact isolation at time of stool collection | Symptoms present on admission, stool test procedure |
|---|---|---|---|---|---|---|---|---|---|
| 68/M | Rotavirus | Diarrhea | Gastroenteritis | 74 | 5 | Transplant and hepatobiliary surgery | Yes | Yes | Yes, other stool tests ordered |
| 30/F | Adenovirus F40/41 | Diarrhea, fatigue | Severe sepsis | 92 | 5 | Adult hospitalist medicine | No | No | Yes, other stool tests ordered |
| 88/F | Rotavirus | Diarrhea | Gastroenteritis | 93 | 9 | Adult hospitalist medicine | No | Yes | Yes, no stool tests ordered |
| 58/F | Norovirus | Diarrhea | Pancreatic insufficiency | 108 | 9 | Adult hospitalist medicine | Yes | Yes | Yes, other stool tests ordered |
| 4/M | *Salmonella* | Diarrhea, fatigue, fever | Pyomyositis | 113 | 5 | General pediatrics | No | No | No |
| 46/M | EPEC | Abdominal pain, vomiting | Gastroenteritis | 129 | 13 | Family practice | No | Yes | Yes, no stool tests ordered |

[a]M, male; F, female. None of the patients had had previous antibiotic treatment.

One of the theories on which the 3-day rule relies is the unlikeliness of acquiring a bacterium (other than *C. difficile*) or parasite while in the hospital. However, the spread of viruses such as Norovirus in a hospital is well documented (7, 8). Imposing the 3-day rule when not necessary might pressure clinicians into using the so-called "shotgun" diagnostic approach, in which they order numerous studies at once. Without such restrictions, they can take a more stepwise approach and order the most valuable diagnostic tests first and then move on to additional tests, such as a GI PCR panel, only if the patient's clinical situation still requires it. Some authors have advocated the use of a modified 3-day rule, allowing testing for patients with certain criteria, such as neutropenia, HIV positivity, or an elevated white blood cell count, or in the setting of a known outbreak (9, 10). In summary, more data are needed to determine if the 3-day rule or other test utilization methods should be applied to GI PCR panels.

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